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Device and method for processing packs supplied continuously on support elements

The present invention relates to a device and a method for supplying and processing packs, especially beverage packs, arranged on support elements with a continuously running conveyor belt, wherein the support elements are arranged on the conveyor belt, wherein two revolving cycle belts are provided after the drawing rollers seen in the running direction of the conveyor belt, wherein the cycle belts revolve in a plane parallel to the plane of the conveyor belt, wherein the cycle belts each have a side facing the other cycle belt and the sides facing one another run parallel to one another at a distance which corresponds to the width of the support elements.

In machines for filling single-use composite packs, pre-formed pack blanks are placed on support elements which are then conveyed on a continuously running conveyor belt from one processing station to the next. The processing stations in this case comprise further forming and sealing stations as well as filling stations and stations for finally closing the packs. The use of a continuously running conveyor belt on which the support elements with the packs are arranged and which is used for transport from one station to the next has the advantage that no complex regulation of the conveyor belts is required. In addition, such a transport system can easily be changed over to a different pack shape or a different pack format merely by exchanging the support elements.

In such a transport system, support elements provided with packs, possibly incoming in batches, are further transported to the next processing station, wherein a backlog possibly occurs before the next processing station if the complete batch is not further processed in a processing step at the same time. However, this backlog does not result in problems since the continuously running conveyor belt can slide away under the support elements.

The device having all of the features of the preamble of claim 1 is known from the US-A-2 781 122.

However, in the area of the processing stations there is then a technical problem with such a transport system if the support elements provided with packs need to be processed individually. In such a case, the support element must be supplied individually in a controlled fashion to the processing station and positioned exactly in the processing station. In this case it is desirable to keep the expenditure on apparatus as low as possible and leave the support elements arranged on the conveyor belt in the simplest case.

It is thus the object of the present invention to arrange and further develop a device and a method of the type specified initially and described previously in detail such that support elements supplied continuously via a conveyor belt can be further processed reliably and with little technical expenditure in a processing station wherein the support elements should be positionable individually and accurately.

This object is solved with regard to the device according to the preamble of claim 1 by providing two drawing rollers on the right and left of the conveyor belt, whose axes of rotation are perpendicular to the plane of the conveyor belt.

As a result of controlled movement of the drawing rollers, the support elements can be transferred individually into a draw-in position. From the draw-in position the support element is then taken over by the cycle belts arranged at the side of the conveyor belt as soon as the cycle belts have been set in motion and are then positioned in the processing station.

When the support elements have reached the desired position in the processing station, the movement of the cycle belts is stopped and the processing can take place. In this case, a controlled movement of the cycle belts allows an exact positioning of the support elements.

Since the support elements are continuously in engagement with the cycle belts, the support elements can remain on the conveyor belt, wherein the conveyor belt slides away under the support element. It is thus not necessary to raise the support elements.

The accuracy of the positioning is further increased because the relative position between cycle belt and support elements is specified. This is achieved by cycle belts having a toothed structure on the sides facing one another and by the support elements also being provided with a toothed structure on the side walls.

According to a further teaching of the invention, the cycle belts are constructed as toothed belts, which are each guided by two toothed belt disks. The slippage between the driven toothed belt disks and the cycle belts is thus minimised which further increases the accuracy of the positioning of the support elements.

A further embodiment of the invention provides that a sensor is provided for detecting a draw-in position of the support elements so that the cycle belt is only set in motion when a support element has actually reached the draw-in position.

In order to facilitate the take-up of the support elements by the cycle belts and the transfer to the conveyor belt, it is especially advantageous if the front and rear teeth of the support elements seen in the transport direction have an enlarged spacing compared with the middle teeth.

In order that the speed of the support elements can be reduced shortly before reaching the draw-in position to avoid an abrupt stop, it is preferable if ....

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